Life-Cycle Flexibility

DESIGN AND EXERCISE OF FLEXIBILITY IN BLENDED WING BODY TYPE AIRCRAFT & HOUSTON GROUND TRANSPORTATION NETWORK

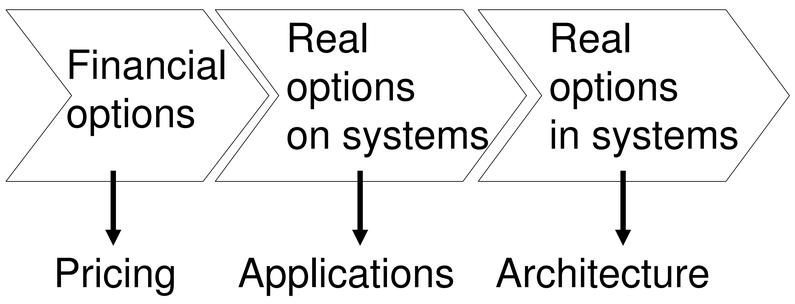
Joshua McConnell, MIT April 17-19, 2007

MOTIVATION

Study Goal:

To develop a framework that will help identify and understand issues pertaining to designing, operating and supporting flexible systems.

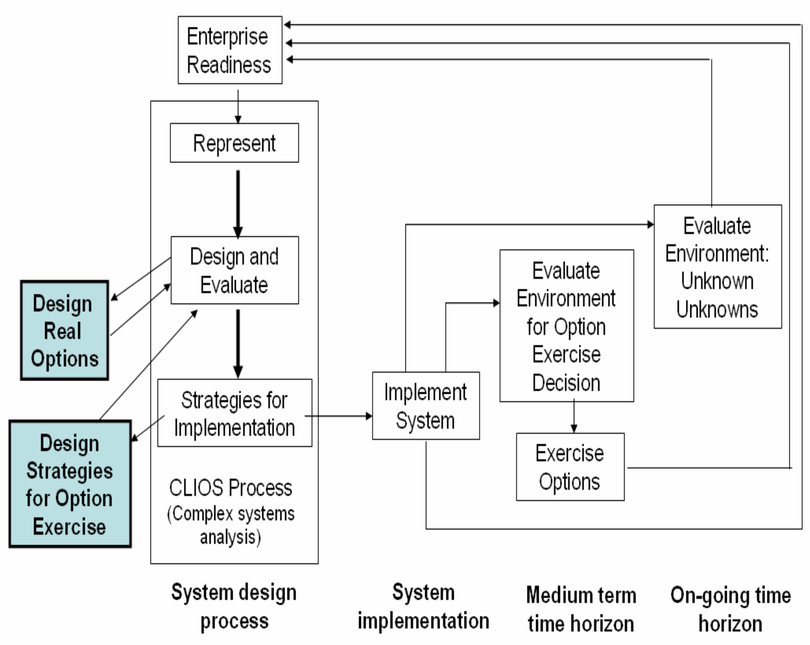
Gaps:



Research Questions:

1. How can tech. and architectures create flexibility in complex systems, like Boeing BWB and Houston transportation system?
2. How should complex systems be designed so that they are "affordable", taking into account range of considerations, like economic, political and org. costs?
3. What type of framework should be developed to aid in enabling, creating and operating flexible systems?

LIFE-CYCLE FLEXIBILITY FRAMEWORK



LCF systematically and comprehensively addresses challenges in flexible systems, such as;

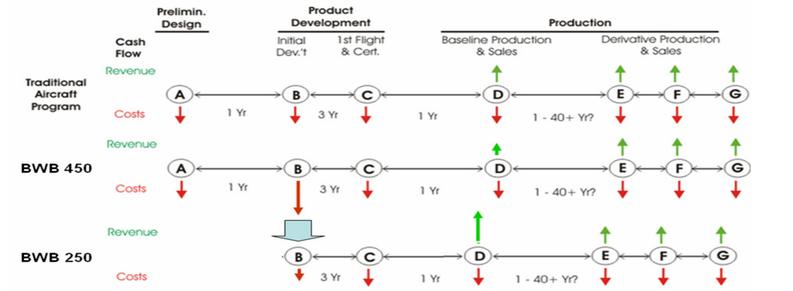
- Difficulty in "triggering", or exercising flexibility
- Evaluating the environment
- Enabling flexibility at enterprise and institutional levels

CASE STUDIES

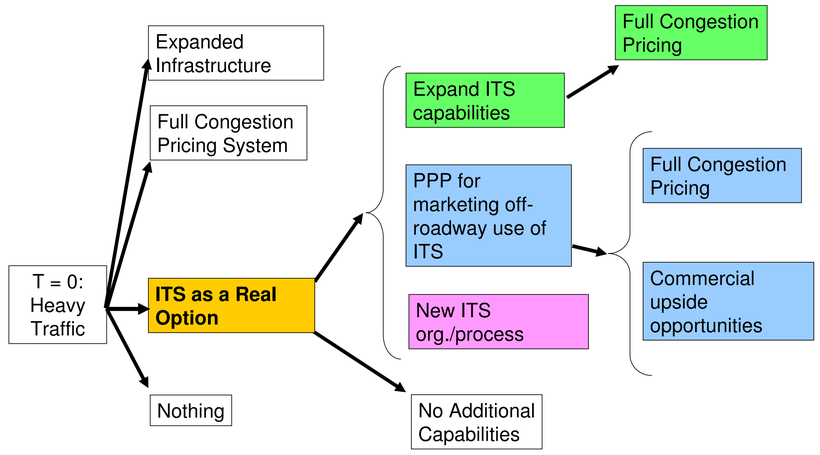
Flexibility w/ BWB Technical Architecture

Dual design value=

inherent value (architecture) + value from flexibility



Flexibility w/ Managed Lanes in Houston



ITS as a real option can enable:

- Basic ITS technical architecture can be based on existing technology, such as HOT lanes
- Modular expansion of ITS technical architecture to full congestion pricing system
- Non-transportation applications enabled for upside potential & implementation support
- Technology supports new ITS org. or processes to cope w/ "unknown unknowns"

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